

SEQUENCE LISTING

<110> Kloting, et al.

<120> Use of the Multifunctional Transcription Factor Yin Yang 1 and Variants Thereof for Treating Illnesses, Especially Type I Diabetes

<130> 30572/41384

<150> PCT/EP03/014762

<151> 2003-12-19

<150> DE 102 61 650.7

<151> 2002-12-20

<160> 232

<170> PatentIn version 3.3

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<211> 2256

<212> DNA

<213> Rattus norv.

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<221> Promoter

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<221> CDS

<222> (73)..(1125)

<223> YY1 (BB/OK)

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<223> Zinc finger

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Met Ala Ser Gly Asp Thr Leu Tyr Ile Ala Thr Asp Gly

1 5 10

tcg gag atg cca gcc gag atc gtg gaa ctg cat gag att gag gtg gag 159

Ser Glu Met Pro Ala Glu Ile Val Glu Leu His Glu Ile Glu Val Glu

15 20 25

acc atc ccg gtg gag act atc gag acc acg gtg gtg ggc gag gag gag	207
Thr Ile Pro Val Glu Thr Ile Glu Thr Thr Val Val Gly Glu Glu Glu	
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gac gac gac gaa gac gac gag gat ggt ggc ggc gga gac cac ggt ggc	255
Asp Asp Asp Glu Asp Asp Glu Asp Gly Gly Gly Gly Asp His Gly Gly	
50 55 60	
ggg ggc ggc cac ggg cac gct ggc cac cac cat cac cac cac cac	303
Gly Gly Gly His Gly His Ala Gly His His His His His His His	
65 70 75	
cac cac ccg ccc atg atc gcg ctg cag ccg ctg gtc acc gac gac ccg	351
His His Pro Pro Met Ile Ala Leu Gln Pro Leu Val Thr Asp Asp Pro	
80 85 90	
acc caa gtg cac cac cac caa gag gtg att ctg gtg cag acg cgc gag	399
Thr Gln Val His His His Gln Glu Val Ile Leu Val Gln Thr Arg Glu	
95 100 105	
gag gta gtg ggt ggc gac gac tcg gac ggg ctg cgc gcc gag gac ggg	447
Glu Val Val Gly Gly Asp Asp Ser Asp Gly Leu Arg Ala Glu Asp Gly	
110 115 120 125	
ttc gag gac cag atc ctc att ccg gta ccc gcg ccg gcc ggc gga gac	495
Phe Glu Asp Gln Ile Leu Ile Pro Val Pro Ala Pro Ala Gly Gly Asp	
130 135 140	
gac gac tac atc gag cag acg ctg gtc acc gtg gcg gcg gcc ggc aag	543
Asp Asp Tyr Ile Glu Gln Thr Leu Val Thr Val Ala Ala Ala Gly Lys	
145 150 155	
agc ggt ggc ggg tct tcg tcg ggc ggc ggc cgc gtt aag aag ggc ggc	591
Ser Gly Gly Gly Ser Ser Ser Gly Gly Gly Arg Val Lys Lys Gly Gly	
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Gly Lys Lys Ser Gly Lys Lys Ser Tyr Leu Gly Ser Gly Ala Gly Ala	
175 180 185	
gcg ggc ggt ggc ggc gcc gac ccg ggt aat aag aag tgg gaa cag aag	687
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190 195 200 205	
cag gtg cag atc aag acc ctg gag ggc gag ttc tcg gtc acc atg tgg	735
Gln Val Gln Ile Lys Thr Leu Glu Gly Glu Phe Ser Val Thr Met Trp	
210 215 220	
tct tca gat gaa aaa aaa gat att gac cat gaa aca gtg gtt gaa gag	783
Ser Ser Asp Glu Lys Lys Asp Ile Asp His Glu Thr Val Val Glu Glu	
225 230 235	
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Gln Ile Ile Gly Glu Asn Ser Pro Pro Asp Tyr Ser Glu Tyr Met Thr	
240 245 250	
ggc aag aaa ctc cct cct gga ggc ata cct ggc att gac ctc tca gac	879
Gly Lys Lys Leu Pro Pro Gly Gly Ile Pro Gly Ile Asp Leu Ser Asp	
255 260 265	
ccc aag caa ctg gca gaa ttt gcc aga atg aag cca aga aaa att aaa	927
Pro Lys Gln Leu Ala Glu Phe Ala Arg Met Lys Pro Arg Lys Ile Lys	
270 275 280 285	

gaa gat gat gct cca aga aca ata gct tgc cct cat aaa ggc tgc aca Glu Asp Asp Ala Pro Arg Thr Ile Ala Cys Pro His Lys Gly Cys Thr 290 295 300	975
aag atg ttc agg gat aac tct gct atg aga aag cat ctg cac acc cac Lys Met Phe Arg Asp Asn Ser Ala Met Arg Lys His Leu His Thr His 305 310 315	1023
ggg ccc aga gtc cac gtc tgt gca gaa tgt ggc aaa gcg ttc gtt gag Gly Pro Arg Val His Val Cys Ala Glu Cys Gly Lys Ala Phe Val Glu 320 325 330	1071
agc tca aag cta aaa cga cac cag ctg gtt cat act gga gaa aag ccc Ser Ser Lys Leu Lys Arg His Gln Leu Val His Thr Gly Glu Lys Pro 335 340 345	1119
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ctcagcagaa tagtaggtgg tttccatcta agcagtgagc catcgatccc caggttctgg	1715
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ggc tgc ggg aag cgc ttt tca ctg gac ttc aat ttg cgc acg cat gtg Gly Cys Gly Lys Arg Phe Ser Leu Asp Phe Asn Leu Arg Thr His Val 360 365 370	1818
cga atc cat acc gga gac agg ccc tat gtg tgc ccc ttc gac ggt tgt Arg Ile His Thr Gly Asp Arg Pro Tyr Val Cys Pro Phe Asp Gly Cys 375 380 385	1866
aat aag aag ttt gct cag tca act aac ctg aaa tct cac atc tta aca Asn Lys Lys Phe Ala Gln Ser Thr Asn Leu Lys Ser His Ile Leu Thr 390 395 400	1914
cac gct aaa gcc aaa aac aac cag tgaaaagaag agagaagacc ttctcgaccc His Ala Lys Ala Lys Asn Gln 405 410	1968
cggaagcct cttcaggagt gtgattggga ataaatatgc ctctcctttg tatattattt	2028
ctaggaagaa ttttaaaaat gaatcctaca cacttaaggg acatgttttg ataaagtagt	2088
aaaaatttaa aaaaatactt taataagatg acattgctaa gatgctctat cttgctctgt	2148

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<223> Zinc finger

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Val Glu Thr Ile Glu Thr Thr Val Val Gly Glu Glu Glu Asp Asp Asp
35 40 45

Glu Asp Asp Glu Asp Gly Gly Gly Gly Asp His Gly Gly Gly Gly Gly
50 55 60

His Gly His Ala Gly His His His His His His His His His His Pro
65 70 75 80

Pro Met Ile Ala Leu Gln Pro Leu Val Thr Asp Asp Pro Thr Gln Val
85 90 95

His His His Gln Glu Val Ile Leu Val Gln Thr Arg Glu Glu Val Val
100 105 110

Gly Gly Asp Asp Ser Asp Gly Leu Arg Ala Glu Asp Gly Phe Glu Asp
115 120 125

Gln Ile Leu Ile Pro Val Pro Ala Pro Ala Gly Gly Asp Asp Asp Tyr
130 135 140

Ile Glu Gln Thr Leu Val Thr Val Ala Ala Ala Gly Lys Ser Gly Gly
145 150 155 160

Gly Ser Ser Ser Gly Gly Gly Arg Val Lys Lys Gly Gly Gly Lys Lys
 165 170 175
 Ser Gly Lys Lys Ser Tyr Leu Gly Ser Gly Ala Gly Ala Ala Gly Gly
 180 185 190
 Gly Gly Ala Asp Pro Gly Asn Lys Lys Trp Glu Gln Lys Gln Val Gln
 195 200 205
 Ile Lys Thr Leu Glu Gly Glu Phe Ser Val Thr Met Trp Ser Ser Asp
 210 215 220
 Glu Lys Lys Asp Ile Asp His Glu Thr Val Val Glu Glu Gln Ile Ile
 225 230 235 240
 Gly Glu Asn Ser Pro Pro Asp Tyr Ser Glu Tyr Met Thr Gly Lys Lys
 245 250 255
 Leu Pro Pro Gly Gly Ile Pro Gly Ile Asp Leu Ser Asp Pro Lys Gln
 260 265 270
 Leu Ala Glu Phe Ala Arg Met Lys Pro Arg Lys Ile Lys Glu Asp Asp
 275 280 285
 Ala Pro Arg Thr Ile Ala Cys Pro His Lys Gly Cys Thr Lys Met Phe
 290 295 300
 Arg Asp Asn Ser Ala Met Arg Lys His Leu His Thr His Gly Pro Arg
 305 310 315 320
 Val His Val Cys Ala Glu Cys Gly Lys Ala Phe Val Glu Ser Ser Lys
 325 330 335
 Leu Lys Arg His Gln Leu Val His Thr Gly Glu Lys Pro Phe Gln Cys
 340 345 350
 Thr Phe Glu Gly Cys Gly Lys Arg Phe Ser Leu Asp Phe Asn Leu Arg
 355 360 365
 Thr His Val Arg Ile His Thr Gly Asp Arg Pro Tyr Val Cys Pro Phe
 370 375 380
 Asp Gly Cys Asn Lys Lys Phe Ala Gln Ser Thr Asn Leu Lys Ser His
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 Ile Leu Thr His Ala Lys Ala Lys Asn Asn Gln
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 Met Ala Ser Gly Asp Thr Leu Tyr Ile Ala Thr Asp Gly
 1 5 10
 tcg gag atg cca gcc gag atc gtg gaa ctg cat gag att gag gtg gag 159
 Ser Glu Met Pro Ala Glu Ile Val Glu Leu His Glu Ile Glu Val Glu
 15 20 25
 acc atc ccg gtg gag act atc gag acc acg gtg gtg ggc gag gag gag 207
 Thr Ile Pro Val Glu Thr Ile Glu Thr Thr Val Val Gly Glu Glu Glu
 30 35 40 45
 gac gac gac gaa gac gac gag gat ggt ggc ggc gga gac cac ggt ggc 255
 Asp Asp Asp Glu Asp Asp Glu Asp Gly Gly Gly Gly Asp His Gly Gly
 50 55 60
 ggg ggc ggc cac ggg cac gct ggc cac cac cat cac cac cac cac cac 303
 Gly Gly Gly His Gly His Ala Gly His His His His His His His His
 65 70 75
 cac cac ccg ccc atg atc gcg ctg cag ccg ctg gtc acc gac gac ccg 351
 His His Pro Pro Met Ile Ala Leu Gln Pro Leu Val Thr Asp Asp Pro
 80 85 90
 acc caa gtg cac cac cac caa gag gtg att ctg gtg cag acg cgc gag 399
 Thr Gln Val His His His Gln Glu Val Ile Leu Val Gln Thr Arg Glu
 95 100 105

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agc ggt ggc ggg tct tcg tcg ggc ggc ggc cgc gtt aag aag ggc ggc Ser Gly Gly Gly Ser Ser Ser Gly Gly Gly Arg Val Lys Lys Gly Gly 160 165 170	591
ggc aag aag agt ggc aag aag agt tac ctg ggc agc ggg gcc ggc gcg Gly Lys Lys Ser Gly Lys Lys Ser Tyr Leu Gly Ser Gly Ala Gly Ala 175 180 185	639
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cag atc att ggg gag aac tca cct cct gat tat tct gaa tat atg aca Gln Ile Ile Gly Glu Asn Ser Pro Pro Asp Tyr Ser Glu Tyr Met Thr 240 245 250	831
ggc aag aaa ctc cct cct gga ggc ata cct ggc att gac ctc tca gac Gly Lys Lys Leu Pro Pro Gly Gly Ile Pro Gly Ile Asp Leu Ser Asp 255 260 265	879
ccc aag caa ctg gca gaa ttt gcc aga atg aag cca aga aaa att aaa Pro Lys Gln Leu Ala Glu Phe Ala Arg Met Lys Pro Arg Lys Ile Lys 270 275 280 285	927
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aag agg ttc agg gat aac tct gct atg aaa aag cat ctg cac acc cac Lys Arg Phe Arg Asp Asn Ser Ala Met Lys Lys His Leu His Thr His 305 310 315	1023
ggt ccc aga gtc cac gtc tgt gca gaa tgt ggc aaa gcg ttc gtt gag Gly Pro Arg Val His Val Cys Ala Glu Cys Gly Lys Ala Phe Val Glu 320 325 330	1071
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	Cys Thr Phe Glu 355
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Gly Cys Gly Lys Arg Phe Ser Leu Asp Phe Asn Leu Arg Thr His Val	
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cga atc cat acc gga gac agg ccc tat gtg tgc ccc ttc gac ggt tgt	1866
Arg Ile His Thr Gly Asp Arg Pro Tyr Val Cys Pro Phe Asp Gly Cys	
	375 380 385
aat aag aag ttt gct cag tca act aac ctg aaa tct cac atc tta aca	1914
Asn Lys Lys Phe Ala Gln Ser Thr Asn Leu Lys Ser His Ile Leu Thr	
	390 395 400
cac gct aaa gcc aaa aac aac cag tgaaaagaag agagaagacc ttctcgaccc	1968
His Ala Lys Ala Lys Asn Asn Gln	
	405 410
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Pro Ala Glu Ile Val Glu Leu His Glu Ile Glu Val Glu Thr Ile Pro
20 25 30

Val Glu Thr Ile Glu Thr Thr Val Val Gly Glu Glu Glu Asp Asp Asp
35 40 45

Glu Asp Asp Glu Asp Gly Gly Gly Asp His Gly Gly Gly Gly Gly
50 55 60

His Gly His Ala Gly His His His His His His His His His His Pro
65 70 75 80

Pro Met Ile Ala Leu Gln Pro Leu Val Thr Asp Asp Pro Thr Gln Val
85 90 95

His His His Gln Glu Val Ile Leu Val Gln Thr Arg Glu Glu Val Val
100 105 110

Gly Gly Asp Asp Ser Asp Gly Leu Arg Ala Glu Asp Gly Phe Glu Asp
115 120 125

Gln Ile Leu Ile Pro Val Pro Ala Pro Ala Gly Gly Asp Asp Asp Tyr
130 135 140

Ile Glu Gln Thr Leu Val Thr Val Ala Ala Ala Gly Lys Ser Gly Gly
145 150 155 160

Gly Ser Ser Ser Gly Gly Gly Arg Val Lys Lys Gly Gly Gly Lys Lys
165 170 175

Ser Gly Lys Lys Ser Tyr Leu Gly Ser Gly Ala Gly Ala Ala Gly Gly
180 185 190

Gly Gly Ala Asp Pro Gly Asn Lys Lys Trp Glu Gln Lys Gln Val Gln
195 200 205

Ile Lys Thr Leu Glu Gly Glu Phe Ser Val Thr Met Trp Ser Ser Asp
210 215 220

Glu Lys Lys Asp Ile Asp His Glu Thr Val Val Glu Glu Gln Ile Ile
225 230 235 240

Gly Glu Asn Ser Pro Pro Asp Tyr Ser Glu Tyr Met Thr Gly Lys Lys
 245 250 255

Leu Pro Pro Gly Gly Ile Pro Gly Ile Asp Leu Ser Asp Pro Lys Gln
 260 265 270

Leu Ala Glu Phe Ala Arg Met Lys Pro Arg Lys Ile Lys Glu Asp Asp
 275 280 285

Ala Pro Arg Thr Ile Ala Cys Pro His Lys Gly Cys Thr Lys Arg Phe
 290 295 300

Arg Asp Asn Ser Ala Met Lys Lys His Leu His Thr His Gly Pro Arg
 305 310 315 320

Val His Val Cys Ala Glu Cys Gly Lys Ala Phe Val Glu Ser Ser Lys
 325 330 335

Leu Lys Arg His Gln Leu Val His Thr Gly Glu Lys Pro Phe Gln Cys
 340 345 350

Thr Phe Glu Gly Cys Gly Lys Arg Phe Ser Leu Asp Phe Asn Leu Arg
 355 360 365

Thr His Val Arg Ile His Thr Gly Asp Arg Pro Tyr Val Cys Pro Phe
 370 375 380

Asp Gly Cys Asn Lys Lys Phe Ala Gln Ser Thr Asn Leu Lys Ser His
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Ile Leu Thr His Ala Lys Ala Lys Asn Asn Gln
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 Asp Thr Leu Tyr Ile Ala Thr Asp Gly Ser Glu Met Pro Ala Glu Ile
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Val Glu Leu His Glu Ile Glu Val Glu Thr Ile Pro Val Glu Thr Ile	
25 30 35	
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Glu Thr Thr Val Val Gly Glu Glu Glu Glu Glu Asp Asp Asp Asp Glu	
40 45 50	
gac ggc ggc ggc ggc gac cac ggc ggc ggc ggc ggc ggc cac ggc cac	246
Asp Gly Gly Gly Gly Asp His Gly Gly Gly Gly Gly Gly His Gly His	
55 60 65	
gcc ggc cac cac cat cac cac cac cac cac cac cac cac cac ccg ccc	294
Ala Gly His His His His His His His His His His His His Pro Pro	
70 75 80	
atg atc gcg ctg gag ccg ctg gtg acg gac gac ccg acc caa gtg cac	342
Met Ile Ala Leu Glu Pro Leu Val Thr Asp Asp Pro Thr Gln Val His	
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cac ctc cag gag gtg atc ctg gtg cag acg cgc gag gag gtc gtc ggg	390
His Leu Gln Glu Val Ile Leu Val Gln Thr Arg Glu Glu Val Val Gly	
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ggg gac gac tcg gag ggc ctg cgc gcc gag gac ggc ttc gag gac gag	438
Gly Asp Asp Ser Asp Gly Leu Arg Ala Glu Asp Gly Phe Glu Asp Glu	
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atc ctc atc ccg gtg ccc gcg ccg gcc ggc ggc gac gac gac tac ata	486
Ile Leu Ile Pro Val Pro Ala Pro Ala Gly Gly Asp Asp Asp Tyr Ile	
135 140 145	
gag cag acg ctg gtc acc gtg gcg gcg gcc ggc aag agc ggc ggc ggg	534
Glu Gln Thr Leu Val Thr Val Ala Ala Ala Gly Lys Ser Gly Gly Gly	
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Ala Ser Ser Gly Gly Gly Arg Val Lys Lys Gly Gly Gly Lys Lys Ser	
165 170 175 180	
ggc aag aag agt tac ctg ggc ggc ggc gcc ggc gcg gcg ggc ggc ggc	630
Gly Lys Lys Ser Tyr Leu Gly Gly Gly Ala Gly Ala Ala Gly Gly Gly	
185 190 195	
ggc gcc gac ccg ggc aat aag aag tgg gag cag aag cag gtg cag atc	678
Gly Ala Asp Pro Gly Asn Lys Lys Trp Glu Gln Lys Gln Val Gln Ile	
200 205 210	
aag acc ctg gag ggc gag tcc tcg gtc acc atg tgg tcc tcg gat gaa	726
Lys Thr Leu Glu Gly Glu Ser Ser Val Thr Met Trp Ser Ser Asp Glu	
215 220 225	
aaa aaa gat att gac cat gaa aca gtg gtt gaa gag cag atc att gga	774
Lys Lys Asp Ile Asp His Glu Thr Val Val Glu Glu Gln Ile Ile Gly	
230 235 240	
gag aac tca cct cct gat tat tct gaa tat atg aca ggc aag aaa ctc	822
Glu Asn Ser Pro Pro Asp Tyr Ser Glu Tyr Met Thr Gly Lys Lys Leu	
245 250 255 260	
cct cct gga ggc ata cct ggc att gac ctc tca gac cct aag caa ctg	870
Pro Pro Gly Gly Ile Pro Gly Ile Asp Leu Ser Asp Pro Lys Gln Leu	
265 270 275	

Val Glu Thr Ile Glu Thr Thr Val Val Gly Glu Glu Glu Glu Glu Asp
 35 40 45

Asp Asp Asp Glu Asp Gly Gly Gly Gly Asp His Gly Gly Gly Gly Gly
 50 55 60

Gly His Gly His Ala Gly His His His His His His His His His His
 65 70 75 80

His His Pro Pro Met Ile Ala Leu Glu Pro Leu Val Thr Asp Asp Pro
 85 90 95

Thr Gln Val His His Leu Gln Glu Val Ile Leu Val Gln Thr Arg Glu
 100 105 110

Glu Val Val Gly Gly Asp Asp Ser Asp Gly Leu Arg Ala Glu Asp Gly
 115 120 125

Phe Glu Asp Glu Ile Leu Ile Pro Val Pro Ala Pro Ala Gly Gly Asp
 130 135 140

Asp Asp Tyr Ile Glu Gln Thr Leu Val Thr Val Ala Ala Ala Gly Lys
 145 150 155 160

Ser Gly Gly Gly Ala Ser Ser Gly Gly Gly Arg Val Lys Lys Gly Gly
 165 170 175

Gly Lys Lys Ser Gly Lys Lys Ser Tyr Leu Gly Gly Gly Ala Gly Ala
 180 185 190

Ala Gly Gly Gly Gly Ala Asp Pro Gly Asn Lys Lys Trp Glu Gln Lys
 195 200 205

Gln Val Gln Ile Lys Thr Leu Glu Gly Glu Ser Ser Val Thr Met Trp
 210 215 220

Ser Ser Asp Glu Lys Lys Asp Ile Asp His Glu Thr Val Val Glu Glu
 225 230 235 240

Gln Ile Ile Gly Glu Asn Ser Pro Pro Asp Tyr Ser Glu Tyr Met Thr
 245 250 255

Gly Lys Lys Leu Pro Pro Gly Gly Ile Pro Gly Ile Asp Leu Ser Asp
 260 265 270

Pro Lys Gln Leu Ala Glu Phe Ala Arg Met Lys Pro Arg Lys Ile Lys
 275 280 285

Glu Asp Asp Ala Pro Arg Thr Ile Ala Cys Pro His Lys Gly Cys Thr
 290 295 300

Lys Met Phe Arg Asp Asn Ser Ala Met Arg Lys His Leu His Thr His
 305 310 315 320

Gly Pro Arg Val His Val Cys Ala Glu Cys Gly Lys Ala Phe Val Glu
 325 330 335

Ser Ser Lys Leu Lys Arg His Gln Leu Val His Thr Gly Glu Lys Pro
 340 345 350

Phe Gln Cys Thr Phe Glu Gly Cys Gly Lys Arg Phe Ser Leu Asp Phe
 355 360 365

Asn Leu Arg Thr His Val Gly Ile His Thr Gly Asp Arg Pro Tyr Val
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 gaggtgattc tgggtgcagac gcgcgaggag gtagtggtg gcgacgactc ggacgggctg 360
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gggatacctg gcattgacct ctcagacccc aagcaactgg cagaatttgc cagaatgaag 840
ccaagaaaaa ttaaagaaga tgatgctcca agaacaatag ct tgc cct cat aaa 894
Cys Pro His Lys
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cag tgc aca ttc gaa ggc tgc ggg aag cgc ttt tca ctg gac ttc aat 942
Cys Thr Phe Glu Gly Cys Gly Lys Arg Phe Ser Leu Asp Phe Asn
5 10 15
ttg cgc acg cat gtg cga atc cat acc gga gac agg ccc tat gtg tgc 990
Leu Arg Thr His Val Arg Ile His Thr Gly Asp Arg Pro Tyr Val Cys
20 25 30 35
ccc ttc gac ggt tgt aat aag aag ttt gct cag tca act aac ctg aaa 1038
Pro Phe Asp Gly Cys Asn Lys Lys Phe Ala Gln Ser Thr Asn Leu Lys
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Tyr Val Cys Pro Phe Asp Gly Cys Asn Lys Lys Phe Ala Gln Ser Thr
 35 40 45

Asn Leu Lys Ser His Ile Leu Thr His
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